PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS)
KAKINADA - 533 001, EAST GODAVARI, A.P.

Affiliated to Adikavi Nannaya University

NAAC Accredited with "A" Grade (3.17 CGPA)

BOARD OF STUDIES OF CHEMISTRY

B.Sc. Petrochemicals Under CBCS

Meeting Minutes/Resolutions

22-23

Convened on 03 November 2022

DEPARTMENT OF PETROCHEMICALS
P. R. GOVT. COLLEGE (Autonomous)

Opp. Mc Laurin High School, Raja Ram Mohan Roy Road, Kakinada

www.prgc.ac.in; e-mail: chemistry_dept@prgc.ac.in

PROCEEDINGS OF THE PRINCIPAL,
P.R. GOVERNMENT COLLEGE(A),KAKINADA-A.P

Present: Dr. B. V. Tirupanyam, M.Sc; Ph.D.

R.C.No.12A/A.C/BOS/2022-23, Dated: 24.09.2022

SUB: P.R. Government College(A), Kakinada-UG Board of Studies (BOS). Program/Course-B.Sc,/Petrochemicals, Nomination of Members- Orders issued.

REF: 1. UGC Guidelines of for Autonomous Colleges-2018.

ORDERS:

The Principal, P.R. Government College(A), Kakinada is pleased to constitute UG Boards of Studiesin Petrochemicals for framing the syllabi in Petrochemicals Subject for all Semesters duly following the norms of the UGC Autonomous guidelines.

S.No	Name of the Nominee	Designation
1	Dr. D. Chenna Rao	Chairman& Lecturer Incharge.
2	Dr. M. Trinadh	University Nominee Lecturer in Chemistry Govt. Degree College (Autonomous), Rajahmundry. Ph: 8639551783
3	Dr. V. Narayana Rao	Subject Expert Lecturer in Chemistry Govt. Degree College ,Perumallapuram.
4	Dr. B. Ramesh Babu	Representative from Industry Founder & M.D., BogaR laboratories,Peddapuram. Ph: 9701712028.
5	V. Sanjeeva Kumar	Member
6	T.V.V.Satya Narayana	Member
7	P. Vijay Kumar	Member
8	V. Rambabu	Member
9	G. Pavani	Member
10	Dr. N. Bujji Babu	Member
11	Dr. Ch. Praveen	Member
12	V. Venkateswara Rao	Member
13	G. Sai Subrahmanyam	Member
14	Ch. Siva Rama Guru Charan	Student Alumni Member
15	K. Krupalavanya II MCPC	Student Member
16	V. Vijay Babu II MCPC	Student Member

The above members are requested to attend the BoS meeting on_____2022 and share their valuable reviews, and suggestions on the following functionaries.

- Prepare syllabi for the subject keeping in view the objectives of the college, interest of the stake holders and National requirement for consideration and approval of the IQAC and Academic Council.
- Suggested methodologies for innovative teaching and evaluation techniques.
- Suggest the panel of Names to the academic council for appointment of Examiners.
- Coordinate research, teaching, extension and other activities in the Department of the college.

PRINCIPAL
P. R. Government College(A),
Kakinada

VISION AND MISSION OF THE COLLEGE

Vision

To provide the right academic environment paving way for intellectual excellence, humane feelings and social commitment. The college believes in providing quality education for the socially disadvantaged, economically weaker sections of the society and thereby help them move up the ladder of success and social order.

Mission

- To impart holistic education with special emphasis on character, culture, updated knowledge and skill-oriented learning.
- To make the students enjoy the fruits of globalization without prejudice to their local and cultural environment.
- To impart necessary life skills so as to make them face any challenge in the bigger world – Social, ethical, psychological or professional.

Signatures of the members who attended the

Board of studies in Petrochemicals 03- 11 -2022 at 10.00 AM

S. No.	Name of the member	Designation	Signature
1	Dr. D. Chenna Rao	Chairman, Board of Studies, Lecturer in charge	
2	Dr. M. Trinadh	University Nominee Lecturer in Chemistry, Govt.College(A), Rajamahendravaram	
3	Dr. V. Narayana Rao	Subject Expert Lecturer in Chemistry, GDC, Perumallapuram	
4	Dr. B. Ramesh Babu	Representative from Industry Founder & M.D., BogaR laboratories, Peddapuram. Ph: 9701712028.	
5	Sri. V.Sanjeeva Kumar	Member Lecturer in Chemistry	
6	Sri. T.V.V. Satyanarayana	Member Lecturer in Chemistry	
7	Sri. P. Vijaya Kumar	Member Lecturer in Chemistry	
8	Sri. V. Rambabu	Member Lecturer in Chemistry	
9	Sri.G.Pavani	Member Lecturer in Chemistry	
10	Dr. N. Bujji Babu	Member Lecturer in Chemistry	
11	Dr. Ch. Praveen	Member Lecturer in Chemistry	
12	V. Venkateswara Rao	Member Lecturer in Chemistry	
13	G.Sai subrahmanyam	Member Lecturer in Chemistry	
14	Ch. Siva Rama Guru Charan	Student Almuni	
14	K. Krupa Lavanya II MCPC	Student Member	
15	V. Vijaya Babu II MCPC	Student Member	

P.R. GOVT.COLLEGE (A), KAKINADA

DEPARTMENT OF PETRO CHEMICALS

Minutes of board of studies (BOS) meeting

2022-23 on _____2022

Meeting of Board of Studies in Petro Chemicals is convened on _____ through offline at P.R. Govt. College (A), Kakinada.

Venue:

Conference Hall, Dt: ------.

The Principal Dr. B.V. Tirupanyam,

Chairman: Dr. D. Chenna Rao

Chairman and lecturer in charge,

Department of Chemistry

University Nominee: Dr. M. Trinadh,

Lecturer in Chemistry,

Govt. College (Autonomous), Rajamahendravaram,

Industrialist: Dr. B. Ramesh Babu,

Founder & M.D., BogaR laboratories, Peddapuram,

Subject Expert Dr.V.NarayanaRao,

Lecturer in Chemistry,

Government Degree College Perumallapuram,

All the faculty members of Chemistry Department and student alumni attended the meeting.

Agenda:

- To discuss the Semester System and Choice Based Credit System (CBCS) being implemented for the past 06 years, i.e., w.e.f. 2015-16.
- To discuss and approve the Continuation/Modifications of the syllabus for the Odd & Even Semesters of I, III & V Years for 2022-23.
- Grant of Extra credits for Online SWAYAM MOOCs etc.
- Syllabus, Model Question Papers and Model Blue Prints for I, II, III, IV, Vand VI Semesters.
- Teaching learning methodology by 60:40 (External: Internal) ratio for the present II- and III-Year Students and 50:50 (External: Internal) ratio I Year Students w.e.f. 2022-23.
- Panel of paper setters and examiners.
- Proposals for Community Service Projects/Extension activities for the benefit of the society.
- Department action plan for 2022-23.

To discuss and resolve the minor modifications/refinement if any, in the Chemistry cluster electives CI, CII & CIII as majority of the students opting this cluster as their choice. Any Other Proposal with the Permission of the Chairman.

Resolutions:

The following agenda items are discussed and resolutions are made.

- It is resolved to continue choice based credit system in the chemistry combination programmes as per the directions of the CCE, Vijayawada to the first year and second year and final year student's w.e.f. 2018-19.
- It is resolved to approve the Continuation/Modifications of the syllabus for the Odd & Even Semesters of I, II & III Years for 2021-22.
- It is resolved to encourage students to active participation in various activities and give extra credits for students after successful completion of a particular activity such as SWAYAM, MOOCS etc., (Annexure –II)
- It is Resolved to follow 60%-40% external and internal w.e.f. 2017-2018 admitted batches and it continued in present second and third year students.
- It is resolved to follow 50%-50% external and internal for first year w.e.f 2021-22 admitted batch.
- It is resolved that every student should maintain 75% attendance for both theory and practicals inorder to attend the Mid and Semester examination.
- It is resolved to conduct departmental activities such as OZONE DAY, CHEM FEST, CHEMISTRY DAY and SCIENCE DAY. (Annexure-I)

- It is resolved to implement the recommended andragogy for the first semester 2022-23 9.Resolved to conduct practical examinations semester wise.
- It is resolved to organize guest lectures by eminent professors.
  Resolved to implement pass minimum for internal assessment for CBSE pattern students as the pattern is learner oriented.
- It is resolved to maintain status quo for same question paper pattern in II, III years. The following paper setters are recommended

1. Sri. U. Sai Krishna, Govt. College(A), Rajamahendravaram.
2. Dr. M. Trinadh, Govt. College(A), Rajamahendravaram
3. Dr. V. Narayana Rao, GDC, Perumallpuram.
4. Sri. M. Sudhakar, Govt. College(A), Rajamahendravaram.
5. Sri. K. Anand, GDC, Pithapuram.
6. Dr. CH. Vijay Vardhan, GDC, Perumallpuram.
7. Sri B. Surendra, GDC, Tadepaliigudem.

Semester wise/ Paper wise Marks / Credits allotted.

YEAR	SEMESTER	PAPER	TITLE	MARKS	CREDITS
I	I	I	Fundamentals of Petroleum Production	100 (50:50)	04
			Practical – I	50	02
	II	II	Modern Petroleum Refining Processes	100 (50:50)	04
			Practical – II	50	02
II	III	III	Introduction to Chemical Engineering	100 (50:50)	04
			Practical – III	50	02
	IV	IV	Heat Transfer and Polymers	100 (50:50)	04
			Practical – IV	50	02
III		V	Mass Transfer operations	100 (50:50)	04
			Practical – V	50	02
	V	VI	Petrochemicals-I	100 60:40	04
			Practical – VI	50	02
		VII	Petrochemicals II	100 60:40	04
			Practical - VII	50	02

	Pithapur Rajah's Government College (Autonomous) Kakinada				Program &Semester II B.Sc. Mathematics, Chemistry, Petrochemicals & Semester-III
CourseCode	Introduction to chemical engineering-III				
Teaching	Hours Allocated: 60 (Theory)	L	T	P	C
Pre-requisites:	Basic laws, venturimetre,chemical reactors	60	10	30	4+2

Course Objectives:

To gains basic knowledge on fluid mechanics.

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1	Gains knowledge on basic laws
CO2	Gains knowledge on basic principle applied in indusries
CO3	Gains knowledge on basic properties of solutions
CO4	Gains knowledge on fluid flowing devices
CO5	Gains knowledge on chemical reactors

Course with focus on employability /entrepreneurship /Skill Development modules

Skill Development		Employability		Entrepreneurship	

Syllabus:

UNIT-I:

Unit operations and unit processes – Basic laws – Ideal Gas Law, Avogadro's Law Dalton's Law, Amagat's Law, Average Molecular weight of a Gas mixture, Density of a Gas mixture, Mole fraction, Mass fraction Gibbs phaserule Henry's Law, Classius – Clapeyron Equation, Cox Chart, Duhring'splot

UNIT-II:

General Principles Applied in studying Industry: - Useful Mathematicalmethods – Method of Least squares, Graphical integration and Graphical differentiation, Dimensional Analysis – The Rayleigh method, the Buckingham Method.

UNIT-III:

Physio-Chemical calculations

Energy Equivalent Mass (weight) solutions – solubility, Distribution coefficient, vapor pressure of solutions, osmosis, Faraday's Laws of Electrolysis – Hardness of water and its removal, Humidity and saturation.

Material Balance – steps to be followed in material balance calculations – Energy balance - steps to be followed in energy balance calculations.

UNIT-IV:

Measuring Devices

Density and specific gravity – Hydrostatic Balance, Pycnometer or specific gravity bottle, Hydrometer, Ostwald Viscometer, Say bolt Viscometer, Spectrophotometric Analysis, Temperature Measurements – Liquid in glass thermometers, thermocouples, optical pyrometers.

UNIT-V:

Flow Meters and Chemical Reactors

Flow meters: Orifice meter, Venturi meter, Pitot tube, Rota meter.

Chemical Reactors: Classification of Chemical Reactors – Batch Reactor, Semi-batch reactor, Continuous Flow Reactors, Continuous Stirred TankReactor (CSTR) Tubular Reactor, fixed – Bed Reactors, Fluidized BedReactors, Moving Bed Reactors.

P.R.GOVT. COLLEGE(A), KAKINADA.

II B.SC.- PETROLEUM & PETROCHEMICALS

MODEL QUESTIONPAPER

PAPER – III – INTRODUCTION TO CHEMICAL ENGINEERING

Time: 2 Hrs. **Max. Marks 50**

PART-I

Answer any THREE questions by attempting at least ONE question from each section

Each Question carries TEN marks. 3X10=30M

SECTION – A

1. Question from Unit –I
2. Question from Unit –II
3. Question from Unit –III

SECTION – B

4. Question from Unit - IV
5. Question from Unit – V
6. Question from unit-I

PART-III

Answer any **FOUR** Questions from the following.

Each Question carries **FIVE** marks. 4 x 5 =20M

7. Question from Unit - I
8. Question from Unit – II
9. Question from Unit – III
10. Question from Unit – IV
11. Question from Unit – V
12. Question from Unit – II
13. Question from Unit – IV

Note to Paper Setter: -

In section I one essay question is to be set from each of the five units.

Similarly in Section II, one short answer question is to be set from each of the 5 units.

P.R.GOVT. COLLEGE(A), KAKINADA.

II B.SC., PETROLEUM & PETROCHEMICALS

SEMESTER - III

PAPER -III: INTRODUCTION TO CHEMICAL ENGINEERING

QUESTION BANK

ESSAY QUESTIONS: 10 M

UNIT -I:

1.a. Write in detail bout Unit Operations
b. State and explain Clausius claypeyron equation

2.a. Write in detail about Unit Processes.
b. State and explain about Gibbs phase rule

3.a. State and explain (i). Ideal gas law and (ii). Henrys law
b. Explain about (i). Cox chart (ii). Duhrings plot

UNIT -II:

1. a. Write in detail about method of Least squares
   b. Explain about Dimensional analysis
2. a. Write about the method of Graphical integration
   b. Explain about the method of Graphical differentiation.

UNIT -III:

1. a. Write about the steps to be followed during material balance calculations
   b. State and explain Faradays laws of electrolysis

2. a. Write about the steps to be followed during energy balance calculations
   b. Write about Hardness of water and its removal

UNIT -IV:

1. a. Explain about the determination of coefficient of viscosity by OstwaldViscometer
   b. Explain about hydrostatic balance

2. a. Explain about the design and functioning of a thermocouple
   b. Explain about the measurement of temperature by liquid in glassthermometer

3. a. Write about the determination of Specific gravity of a liquid by Pyknometer
   b. Explain about the Spectrophotometric analysis with applications.

UNIT -V:

1. a. Explain briefly about Continuous flow reactors
   b. Write in detail about Batch reactor
2. a. Explain the design and working of a Pitot tube
   b. With a neat diagram explain the functioning of Fluidized Bed Reactor.
3. a. Write about Continuous stirred tank reactor (CSTR) and tubular reactor
   b. Explain in detail about Orifice meter.
4. a. Write in detail about Rota meter.
   b. Explain in detail about fixed bed reactors.

SHORT ANSWER QUESTIONS: 5 MARKS

UNIT - I:

1. State and explain Amagats law
2. State the Daltons law and Avogadro's law
3. Write about Average molecular weight of a gas mixture andDensity of gas mixture
4. Explain about Mole fraction and mass fraction

UNIT - II:

1. Write about Rayleigh method
2. Explain about Buckingham method
3. Write a note on graphical integration

UNIT - III:

1. Write a short note on Distribution coefficients
2. Explain about Osmosis
3. Write about Humidity and saturation
4. Write about Vapour pressure of a solution

UNIT - IV:

1. Write briefly about Optical pyrometers
2. Explain briefly about determination of viscosity by Sayboltviscometer
3. Write about the determination of Specific gravity by Hydrometer
4. Explain the terms Density and Specific gravity.

UNIT - V:

1. Write a short note on classification of chemical reactors
2. Explain briefly about Semi batch reactor
3. Write about moving bed reactor.

IMPORTANT NOTE TO PAPER SETTER:

In section - I, one essay question is to be set from each of the five units.

Similarly in Section - II, one short answer question is to be set from each of the five units Questions should be given from QUESTION BANK.

P.R.GOVT. COLLEGE(A), KAKINADA.

II B.SC., PETROLEUM & PETROCHEMICALS

PRACTICAL SYLLABUS

SEMESTER - III

PRACTICAL - III (At the end of Third Semester)

1. Aniline point determination – Method A
2. Carbon Residue by Ramsbottom method.
3. Carbon Residue by Conradson method.
4. Saybolt Viscometer.

SCHEME OF EVALUATION **Max. Marks: 50**

5. Procedure to be written in the first 15 minutes **15 Marks**
6. Recording of data and reporting the value.

Up to 2% error	**25 Marks**
Error up to 5%	**15 Marks**
Error greater than 5%	**10 Marks**

7. Viva – Voice **5 Marks**
8. Record **5 Marks**

Referencebooks

1. Introduction to Chemical Engineering by Salil K. Ghosal andothers. Tata Mc. Graw-Hill Publishing Company.
2. Unit operations – I and II by K.A. Gavhane. Nirali Prakashan – Pune.

WebLinks:

1.https://youtu.be/P--6V7Lusoo

2.https://youtu.be/_3JVLyMv5II

3. https://youtu.be/XL2IqiImLO4

Activities & Benchmarks Proposed (Table)

1.Assignments
2.Seminars
3.Group Discussion
4. Quiz

CO-PO Mapping:

(1:Slight [Low]; 2:Moderate[Medium]; 3:Substantial[High], '-':No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO 1	3	2	3	1	3	2	3	2	2	2	3	3	2
CO 2	3	3	2	3	2	2	1	2	2	2	3	3	2
CO 3	3	3	3	3	3	2	2	2	2	2	3	3	2
CO 4	3	3	3	3	3	2	2	2	2	2	3	2	3
CO 5	3	2.8	2.8	2.5	2.8	2	2	2	2	2	3	2.8	2.3

Weightage to content
Semester -III
Paper-III

S.No	Course Content	Long Answer	Short Answer	Total marks	As per Blooms Taxonomy
1	Unit operations-I	2	1	25	Understanding, Application
2	Unit operations-II	1	2	20	Remembering, Understanding
3	Physio-chemical calculations	1	1	15	Application & Creation
4	Measuring devices	1	2	15	Remembering, Understanding
5	Flow metres & chemical reactors	1	1	20	Application & Creation
	TOTAL	6	7	95	